## REMARKS

Further consideration of this application and Paper No. 9 are courteously solicited.

Applicant and the undersigned take this opportunity to again thank the Examiner for his time and understanding in granting back-to-back interviews to discuss this application, the cited art and the claims. The first of the two interviews was held on May 24, 2001 and the second interview was held about a month later, on June 19, 2001. During the interviews, details of the operation of the Applicant's invention were discussed, together with a comparison of the Applicant's invention and the algorithm by which the system of the Arevalo patent operates.

The Interview Summary prepared at the conclusion of each interview includes an attachment prepared by the Applicant's Japanese patent counsel to highlight the difference between the operation of Applicant's system and the operation of Arevalo's system. This paper briefly will review the different operational approaches taken by the Applicant and Arevalo as depicted in the attachments, then go on to address a central issue remaining after the interviews, and conclude by addressing each rejection stated in Paper No. 9 expressly.

The attachment to the Interview Summary dated May 24, 2001 does not portray Applicant's inventive method to Applicant's satisfaction and so it was superceded by the attachment to the June 19, 2001 Summary. Both attachments show how Arevalo repetitively divides the intensity value range in half, during iterative steps 1-5. By so

dividing the range of laser intensity values, Arevalo hopes to arrive at an intensity value range corresponding to the optimal laser intensity value indicated by the small circle in the attachments. However, as discussed during the interviews, for the reason that it cannot be assured that exactly the same portions of the photoreceptor surface will be exposed by the laser exposure mechanism at each repetition, the target or optimal intensity value is depicted as floating in each attached illustration such that, in Arevalo's iteration 4, Arevalo cannot choose a reduced range that captures value I4. This cannot be corrected when an even smaller range is chosen in iteration 5.

Applicant's method, by contrast, performs two different types of potential detection steps in order to capture the optimal intensity value. Applicant's first, or coarse, potential detecting step provides a wide range of laser intensity values according to a relatively large step interval, exposes the photoreceptor surface at each such intensity, and then detects the surface portions to determine which intensity value the target intensity is nearest. This sets the stage for the Applicant's (multiple repetitions of) the second, or fine, potential detecting step.

The fine detecting step divides a region about the intensity value discovered during the coarse potential detecting step into smaller interval steps in order to much more accurately determine the desired target intensity value. Even if the target value "floats", as illustrated in the depiction of Arevalo's algorithm, Applicant's method still eventually will capture the value because the fine detection step processing continually is repeated until the value has been captured. In discussing the claims and the

disclosure during the interview, the Examiner had been concerned about whether those of ordinary skill in the art would have been led by the Applicant's disclosure to maintain the same range of intensity values for each successive repetition of the fine potential detecting step. Applicant courteously urges that his original disclosure ensures that this question is answered in the affirmative.

Throughout the Applicant's disclosure, it is clear that the coarse potential detecting step locates, in the words of the claims, a selected potential closest to the predetermined set potential. This located potential becomes the focus for the subsequent repetition of the fine potential detecting steps. Because the coarse potential detecting step is performed only once, this located potential is fixed after the coarse potential detecting step has been completed. Hence, those of ordinary skill in the art would understand that the "POTENTIAL NEAREST TO DESIRED POTENTIAL" in step S7 of Figure 1 is always the same after the performance of the coarse potential detecting step, because the coarse potential detecting step is performed only once.

By now we see that those of ordinary skill in the art are taught that the repeated fine potential detecting steps are carried out in a relatively smaller range about the intensity value determined by the coarse potential detecting step, and that the focalpoint of that smaller range is the "POTENTIAL NEAREST TO DESIRED POTENTIAL" located during that same coarse detecting step. We next examine portions of Applicant's specification that give specific examples for the coarse and fine potential detecting steps.

Only one set of interval step intensity values are given for the coarse potential detecting step in the paragraph bridging pages 10-11. Likewise, only one set of fine interval step intensity values is given for the fine potential detecting step example described in the paragraph bridging pages 11-12. Nothing in Applicant's original disclosure leads those of ordinary skill in the art to change the small interval intensity value steps taught by this paragraph bridging pages 11-12, during repetitive performance of steps S4 - S7. Rather, as described in the last two sentences of the referenced paragraph, "Then, using these laser intensities thus selected, the operations of steps S4 - S6 are repeated. Thereafter, the step S7 and the steps S4 - S6 are repeated until the finished condition is satisfied at the step S6." In those sentences, the words "these laser intensities thus selected"are those given in the example immediately above, that is, the small interval intensities $P_{max}$ x (950/1023), $P_{max}$ x (952/1023), $P_{max}$ x (954/1023), $P_{max}$ x (956/1023) and $P_{max}$ x (958/1023).

Applicant thus respectfully urges that his disclosure teaches those of ordinary skill in the art not to further reduce the intensity value range used during the subsequent repetitions of the fine potential detecting step. Rather, Applicant specifically does not want to change the small interval intensity values used during each subsequent repetition of such fine potential detecting step, in order to avoid the pitfalls of Arevalo. Those of ordinary skill in the art would have been led to repeatedly use the same fine intensity values for each subsequent repetition of step S7 during the fine intensity value

processing. The located "POTENTIAL NEAREST TO DESIRED POTENTIAL" is always the focalpoint of the relatively small interval range of intensity values analyzed during the repeated fine potential detecting steps. Each successive operation of step S7 will result in the same laser intensity values, within the same small range, being used during each repeated loop process from steps S4 - S7.

The Applicant's particular method of carrying out the fine potential detecting step patentably distinguishes his invention from the combination of admitted prior art and Arevalo, as asserted in Paper No. 9. With reference to claim 1, Applicant's second, or fine, potential detecting step includes separate sub-steps of (i) <u>obtaining a second plurality</u> of laser intensity values, (ii) respectively exposing a surface portion of said photoreceptor surface with light having an intensity corresponding to each of said <u>second plurality</u> of intensity values, and (iii) detecting the potential of each such exposed photoreceptor portion. Thereafter, the "repeating step" calls for repeating steps (ii) and (iii) of the second potential detecting step. Applicant emphasizes that, completely unlike Arevalo, there is no calculation of a <u>third plurality</u>, <u>fourth plurality</u>, etc. of intensity values used to expose the photoreceptor surfaces during the Applicant's recited "repeating step." Arevalo, remember, teaches reduction of the intensity value range by one-half each time his potential detecting algorithm is repeated. Applicant, by contrast, restrains his "repeating step" to repetition of second, or fine, potential detecting step sub-steps (ii) and (iii) which use only the <u>second plurality of intensity values</u>

calculated at sub-step (i) of his fine potential detecting step. Thus, Applicant's recited "repeating step" excludes further narrowing the small step intensity value intervals used at each subsequent repetition of his fine potential detecting step. As such, claim 1 patentably distinguishes over the asserted prior art and Arevalo.

Independent claim 2 patentably distinguishes over the asserted combination for much the same reasons as independent claim 1. Independent claim 2, likewise, recites calculation of only a "second plurality of intensity values" during sub-step (ii) and repeating such sub-step until the process is complete. Independent claim 2 thus likewise excludes further reduction of the fine potential detecting step interval by calling for repeating of the fine detecting step using the "second plurality of laser intensity values", not a third, a fourth, etc., as taught by Arevalo. As such, independent claim 2 together with its dependent claims 3-5 patentably distinguish over the combination asserted in Paper No. 9.

In addition to the rejection of claims 2-5 under 35 U.S.C. §103(a) over admitted prior art and Arevalo that was addressed immediately above, Paper No. 9 included two additional rejections. These additional rejections were based upon 35 U.S.C. §112. The rejection of claim 1 was alleged on the basis of the first paragraph of §112, while a rejection of all the claims, 1-5, was alleged based upon the second paragraph of §112. It is the recollection of the undersigned that the Examiner indicated that these rejections would be addressed and overcome by the claim amendments made herein. It courteously is urged that all of the pending claims are in full compliance with the

requirements of 35 U.S.C. §112. Hence, withdrawal of these rejections under that section courteously are solicited.

In view of the foregoing amendments and Remarks, it courteously is urged that all of the pending claims are allowable and that this patent application is now in condition for allowance. Favorable action in that regard earnestly is solicited.

If any fees under 37 C.F.R. §§1.16 or 1.17 are due in this filing, please charge the fees to Deposit Account 02-4300; Order No. 032739.008. If an extension of time under 37 C.F.R. §1.136 is necessary and not included herewith, such an extension is requested. The extension fee should be charged to Deposit Account 02-4300; Order No. 032739.008.

Respectfully submitted,

SMITH, GAMBRELL & RUSSELL, LLP

By: ______________________

Michael A. Makuch, Reg. No. 32,263
1850 M Street, NW - Suite 800
Washington, DC 20036
Telephone: (202) 659-2811
Facsimile: (202) 263-4329

July 26, 2001

162312

# MARKED-UP COPY OF THE PREVIOUS VERSION

1. (Three Times Amended) A laser intensity adjusting method of adjusting a maximum intensity of a laser exposure mechanism for irradiating laser light to a surface of a photoreceptor to which a uniform potential is being given by a corona discharger, the method comprising:

a first potential detecting step including the steps of (i) [exposing photoreceptor surface portions to laser lights of] obtaining a first plurality of laser [intensities, obtained] intensity values by dividing a predetermined laser intensity value [into] by a first plurality of selected values such that said intensity values of said first plurality thereof increase from an initial value to said predetermined intensity value according to a first [intervals, and] interval to provide a first range of intensity values, (ii) respectively exposing a surface portion of said photoreceptor surface with a laser light having an intensity corresponding to each of said first plurality of intensity values to provide exposed photoreceptor surface portions, and (iii) detecting [potentials] the potential of [the] each of said exposed photoreceptor surface portions [exposed to the laser lights of the plurality of laser intensities, wherein] whereby each of said potentials corresponds to one of said [plurality of] laser intensities corresponding to said first plurality of intensity values;

a second potential detecting step including the steps of (i) obtaining a second plurality of laser intensity values by dividing [the] said predetermined laser intensity value [into a plurality of second intervals so as to set a plurality of laser intensities, wherein] by a second plurality of selected values such that said intensity values of said second plurality thereof increase from an initial value to a predetermined intensity value according to a second interval to provide a second range of intensity values, said second [plurality of intervals are] interval being smaller than said first [plurality of intervals] interval and said second range being smaller than said first range, [and] said [plurality of laser intensities are in a range including a] laser intensity values of said second plurality being selected to be close to a laser intensity value corresponding to [a] one selected potential selected from the potentials detected [at the] during said first potential detecting step, [and wherein the] said one selected potential [is] being closest[, out of the potentials detected at the first potential detecting step,] to a predetermined set potential, (ii) respectively exposing a surface portion of said photoreceptor surface with laser light having an intensity corresponding to each of said second plurality of intensity values to provide exposed photoreceptor surface portions [to laser lights of the plurality of laser intensities thus set], and (iii) detecting [potentials] the potential of [the] each of said exposed photoreceptor surface portions [exposed to the laser lights of the plurality of laser intensities]; and

a repeating step of (i) repeating [the] steps (ii) and (iii) of said second potential detecting step until there is obtained a potential equal to or substantially equal to [the] said predetermined set potential, and (ii) setting, as [the] said maximum intensity, [the] a laser intensity corresponding to [the] said potential thus obtained[,

wherein the plurality of laser intensities in the first potential detecting step are set within a range that is narrower than a full range from zero to the predetermined laser intensity value, and wherein an optimal maximum intensity lies within said full range].

2. (Three Times Amended) A laser intensity adjusting method of adjusting a maximum intensity of a laser exposure mechanism for irradiating laser light to a surface of a photoreceptor to which a uniform potential is being given by a corona discharger, the method comprising:

a first potential detecting step including the steps of (i) [exposing photoreceptor surface portions to laser lights of a] obtaining a first plurality of laser [intensities set at first intervals, and] intensity values that increase from an initial value to a predetermined value according to a first interval to provide a first range of intensity values, (ii) exposing a surface portion of said photoreceptor surface with laser light having an intensity corresponding to each of said first plurality of intensity values to provide exposed photoreceptor surface portions, and (iii) detecting [potentials] the

potential of [the] each of said exposed photoreceptor surface portions [exposed to the laser lights of the plurality of laser intensities];

a second potential detecting step including the steps of (i) obtaining a second plurality of laser intensity values that increase from an initial value to a predetermined value according to a second interval to provide a second range of intensity values, said second interval being smaller than said first interval and said second range being smaller than said first range, (ii) respectively exposing a surface portion of said photoreceptor surface with laser light having an intensity corresponding to each of said second plurality of intensity values to provide exposed photoreceptor surface portions [to laser lights of a plurality of laser intensities which are set, at second intervals smaller than the first intervals and are in a range including a laser intensity with which there has been detected, at the first potential detecting step, a potential which is closest, out of the potentials detected at the first potential detecting step, to a predetermined set potential], and [(ii)] (iii) detecting [potentials of] the potential of each of said exposed photoreceptor surface portions [exposed to the laser lights of the plurality of laser intensities]; and

a step of setting, as [the] a maximum intensity of the laser exposure mechanism, a laser intensity with which there has been detected, at [the] said first or said second potential detecting step, a potential equal to or substantially equal to [the] a predetermined set potential,

wherein [the plurality of laser intensities in the first potential detecting step are set within a range that is narrower than a full range from zero to a predetermined laser intensity value, and wherein an optimal maximum intensity lies within said full range] said steps (ii) and (iii) of said second potential detecting step are repeated until there is obtained a potential equal to or substantially equal to [the] said predetermined set potential, and said laser intensities corresponding to said second plurality of intensity values are selected to be close to a laser intensity value corresponding to a potential detected during said first potential detecting step as closest to said predetermined set potential.

# AMENDED CLAIMS

1. (Three Times Amended) A laser intensity adjusting method of adjusting a maximum intensity of a laser exposure mechanism for irradiating laser light to a surface of a photoreceptor to which a uniform potential is being given by a corona discharger, the method comprising:

a first potential detecting step including the steps of (i) obtaining a first plurality of laser intensity values by dividing a predetermined laser intensity value by a first plurality of selected values such that said intensity values of said first plurality thereof increase from an initial value to said predetermined intensity value according to a first interval to provide a first range of intensity values, (ii) respectively exposing a surface portion of said photoreceptor surface with a laser light having an intensity corresponding to each of said first plurality of intensity values to provide exposed photoreceptor surface portions, and (iii) detecting the potential of each of said exposed photoreceptor surface portions whereby each of said potentials corresponds to one of said laser intensities corresponding to said first plurality of intensity values;

a second potential detecting step including the steps of (i) obtaining a second plurality of laser intensity values by dividing said predetermined laser intensity value by a second plurality of selected values such that said intensity values of said second plurality thereof increase from an initial value to a predetermined intensity value

C1

according to a second interval to provide a second range of intensity values, said second interval being smaller than said first interval and said second range being smaller than said first range, said laser intensity values of said second plurality being selected to be close to a laser intensity value corresponding to one selected potential selected from the potentials detected during said first potential detecting step, said one selected potential being closest to a predetermined set potential, (ii) respectively exposing a surface portion of said photoreceptor surface with laser light having an intensity corresponding to each of said second plurality of intensity values to provide exposed photoreceptor surface portions, and (iii) detecting the potential of each of said exposed photoreceptor surface portions; and

C1 cont

a repeating step of (i) repeating steps (ii) and (iii) of said second potential detecting step until there is obtained a potential equal to or substantially equal to said predetermined set potential, and (ii) setting, as said maximum intensity, a laser intensity corresponding to said potential thus obtained.

2. (Three Times Amended) A laser intensity adjusting method of adjusting a maximum intensity of a laser exposure mechanism for irradiating laser light to a surface of a photoreceptor to which a uniform potential is being given by a corona discharger, the method comprising:

a first potential detecting step including the steps of (i) obtaining a first plurality of laser intensity values that increase from an initial value to a predetermined value according to a first interval to provide a first range of intensity values, (ii) exposing a surface portion of said photoreceptor surface with laser light having an intensity corresponding to each of said first plurality of intensity values to provide exposed photoreceptor surface portions, and (iii) detecting the potential of each of said exposed photoreceptor surface portions;

C1 cont

a second potential detecting step including the steps of (i) obtaining a second plurality of laser intensity values that increase from an initial value to a predetermined value according to a second interval to provide a second range of intensity values, said second interval being smaller than said first interval and said second range being smaller than said first range, (ii) respectively exposing a surface portion of said photoreceptor surface with laser light having an intensity corresponding to each of said second plurality of intensity values to provide exposed photoreceptor surface portions, and (iii) detecting the potential of each of said exposed photoreceptor surface portions; and

a step of setting, as a maximum intensity of the laser exposure mechanism, a laser intensity with which there has been detected, at said first or said second potential detecting step, a potential equal to or substantially equal to a predetermined set potential,

wherein said steps (ii) and (iii) of said second potential detecting step are repeated until there is obtained a potential equal to or substantially equal to said

C1 con't

predetermined set potential, and said laser intensities corresponding to said second plurality of intensity values are selected to be close to a laser intensity value corresponding to a potential detected during said first potential detecting step as closest to said predetermined set potential.

162312